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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/055,568	01/22/2002	Mou-Shiung Lin	JCLA8533	6093

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NORTH AMERICA INTELLECTUAL PROPERTY CORPORATION
P.O. BOX 506
MERRIFIELD, VA 22116

EXAMINER

MITCHELL, JAMES M

ART UNIT	PAPER NUMBER
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2813

DATE MAILED: 08/11/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/055,568

Applicant(s)

LIN ET AL.

Examiner

James M. Mitchell

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 February 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 219-267 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 219-267 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

1. This office action is in response to applicant's amendment filed February 27, 2006.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claim 219- 224, 227, 228, 231, 232, 235, 236, 237, 243, 24, 250, 251, 257, 260, 263, 264, 266 and 267 are rejected under 35 U.S.C. 102(e) as being anticipated by Maruyama (U.S.2001/0042901).
4. Maruyama (Fig. 2, 10, 17A-D, 19) discloses:
(cl. 219, 264) a chip package comprising: a preformed¹ substrate (11) comprising silicon, semiconductor material (Par.0083), said substrate having no circuitry; only one die (12; Fig. 19) joined with said substrate (Fig. 2); and a patterned line (e.g. 15) over said only one die and over said substrate;

¹ With respect to preformed limitation, this is a process limitation that does not impart a structural difference than that shown by chips embedded in a wafer. Note, "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

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(cl. 220, 263) wherein said die comprising a thin- film circuit layer/ multiple active devices formed therein (e.g. within die; Fig. 10), said patterned line having a thickness greater than that of said thin-film circuit layer (e.g. can see 15);

(cl. 223) wherein said patterned line connects multiple portions of said only one die (e.g. IC within die send signal though 15);

(cl. 224) an insulating layer (20) between said only one die and said patterned line;

(cl. 227, 231) said insulating layer comprises a porous (e.g. all material has a level of porosity) chip package;

(cl. 228, 232, 235) further comprising an insulating layer (22) over said patterned line;

(cl. 236, 237, 243, 244) further comprising passive device comprising a capacitor² over said substrate;

(cont. cl. 243, 251, 266) said only one preformed die having a top surface and a lower surface said substrate being under said lower surface of said only one preformed die, said top surface of said only one preformed die being at a horizontal level (e.g. top pf chip and top of substrate co-planar) wherein said passive device is over said horizontal level ("passive elements...on a redistribution layer"; Fig. 17C);

(cl. 250) wherein an opening (e.g. space taken by 12) is in said substrate and accommodates said only one die (Fig. 19);

² Characteristic of wiring separated by insulation.

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(cl. 257) with the insulation (e.g. 22) over (e.g. above) said substrate and around said only die (e.g. to left and right of die);

(cl. 260) further comprising a bump (16) on line;

(cl. 267) and a portion of line not under die (e.g. farthest left portion of 15; Fig. 17C).

5. With respect to the intended use limitations of claim 221 and 222 that for example the lines are power or ground bus, the prior art forms the same structure as the claimed invention. As such, the claim would not be distinguishable over the prior art, since it has been held that the manner in which a claimed apparatus is intended to be employed does not differentiate the claimed apparatus from a prior art apparatus satisfying the claimed structural limitations. *Ex parte Masham*, 2 USPQ2d 1647 (1987).

6. Claim 219- 224, 226-228, 231, 232, 235, 236-239, 243-246, 250 and 251, 257, 259, 260, 261, 263-267 are rejected under 35 U.S.C. 102(e) as being anticipated by Tabrizi (U.S. 6,867,499).

7. Tabrizi³ (Fig. 2, 5) discloses:

(cl. 219, 264) a chip package comprising: a preformed⁴ (understood to be made separate from the chip/substrate) substrate (510) comprising silicon,

³ Alternatively, Towle et al. (U.S. 2002/0074641) could be used to anticipate the claims

⁴ Although the prior art discloses a preformed substrate and die, the limitation is a process limitation that does not impart a structural difference than for example and chip mounted to/on a substrate whether preformed or if the chip is made embedded in the substrate. Note, "even though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious

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semiconductor material (CLM 12 of Tabrizi), said preformed substrate having no circuitry (Fig. 5); only one preformed die (520) joined (e.g. 530) with said preformed substrate; and a patterned line (e.g. 560) over said only one preformed die and over said preformed substrate;

(cl. 220) wherein said preformed die comprising a thin-film circuit layer formed therein (e.g. within die; Col. 2, Lines 51-54), said patterned line having a thickness greater than that of said thin-film circuit layer (e.g. can see 560);

(cl. 223) wherein said patterned line connects multiple portions of said only one preformed die (e.g. IC within die send signal through 560);

(cl. 224) an insulating layer (550) between said only one preformed die and said patterned line;

(cl. 226) said insulating layer comprises benzocyclobutene (BCB) (Col. 2, Lines 21-23 & 39-40);

(cl. 227, 231) said insulating layer comprises a porous (e.g. all material has a level of porosity) chip package;

(cl. 228, 232, 235) further comprising an insulating layer (570) over said patterned line;

(cl. 236, 237, 238, 239, 244, 245, 246) further comprising passive device comprising a capacitor/ inductor/ resistor over said substrate (Col. 5, Lines 1-4);

(cl. 243, 251) said only one preformed die having a top surface and a lower surface said preformed substrate being under said lower surface of said only one preformed die, said top surface of said only one preformed die being at a

from a product of the prior art, the claim is unpatentable even though the prior product was made

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horizontal level (e.g. top of chip and top of substrate co-planar) wherein said passive device is over said horizontal level ("passive elements...on a redistribution layer"⁵; Col. 5, Lines 1-4);

(cl. 250) wherein an opening (515) is in said preformed substrate and accommodates said only one preformed die (Fig. 5);

(cl. 257) with the insulation (e.g. 570) over (e.g. above) said substrate and around said only die (e.g. to left and right of die);

(cl. 259) wherein insulation above pattern is an epoxy (Par. 0104)

(cl. 260, 261) further comprising a solder bump (580; CLM 13 of Tabrizi) on said patterned;

(cl. 263) die is an integrated circuit and therefore has multiple active devices;

(cl. 265) with the pattern comprises copper (CLM 3 of Tabrizi).

8. With respect to the intended use limitations of claim 221 and 222 that for example the lines are power or ground bus, see paragraph 5 of this office action.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985)

⁵ Items 550 & 560 above horizontal forms part of redistribution layer.

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10. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

11. Claims 225, 226, 229, 230, 233, 258, 261, 262 and 265 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maruyama (U.S.2001/0042901).

12. Maruyama further discloses its line is a conductive material (Par. 0086) and the elements stated in paragraph 4 of this office action, but does not appear to explicitly disclose it being copper, or that the material of its bump or insulation being for example gold, solder, BCB or polyimide.

13. Applicant has not disclosed that the selection of his materials produces unexpected results or otherwise critical. As such, the selection would have been obvious to one of ordinary skill in the art, since it has been held that selection of a known material⁶ based on its suitability for its intended use supported a prima facie obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945); See M.P.E.P 23144.07.

⁶ Copper and Gold are known conductors, while BCB and polyimide are known insulators.

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14. Claims 225, 229, 230, 233, 234, 258, 259 and 262 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Nagakari et al. (U.S. 6,573,584).

15. Tabrizi discloses the elements stated in paragraph 7 of this office action, but fails to disclose that its insulation may be a polyimide.

16. However Tabrizi discloses the same invention as claimed except that its insulation is disclosed as BCB instead of polyimide, Nagakari (Col. 5, Lines 25-29) shows that both BCB and polyimide produce equivalent structures known in the art. Therefore, because these two insulators are art recognized equivalents at the time the invention was made, one of ordinary skill in the art would have found it obvious to select polyimide for BCB insulator.

17. Moreover, applicant has not disclosed that his selection of material (e.g. old, BCB, Polyimide; see footnote 6) produces unexpected results or otherwise critical. As such, the selection of the claimed material for example BCB or a polyimide as an insulator under or over the patterned line would have been obvious to one of ordinary skill in the art, since it has been held that selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination. *Sinclair & Carroll Co. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945); See M.P.E.P 23144.07.

18. Claims 240 and 247 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Tahara et al. (U.S. 2002/0017730).

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19. Tabrizi discloses the elements stated in paragraph 7 of this office action, but fails to explicitly disclose a filter as a passive device.

20. Tahara utilizes a filter as a passive device (Par. 0069).

21. It would have been obvious to one of ordinary skill in the art to incorporate a wave guide into the structure of Tabrizi in order to provide a passive component as required by Tabrizi (Col. 5, Lines 1-4).

22. Claims 241 and 248 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Shuy et al. (U.S. 2003/0118738)

23. Tabrizi discloses the elements stated in paragraph 7 of this office action, but fails to explicitly disclose a wave-guide as a passive device.

24. Shuy utilizes a wave-guide as a passive device (e.g. CLM 8 of Shuy).

25. It would have been obvious to one of ordinary skill in the art to incorporate a wave guide into the structure of Tabrizi in order to provide a passive component as required by Tabrizi (Col. 5, Lines 1-4).

26. Claims 242 and 249 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Jun et al. (U.S. 2002/0084510)

27. Tabrizi discloses the elements stated in paragraph 7 of this office action, but fails to explicitly disclose a MEMS as a passive device.

28. Jun utilizes a MEMS as a passive device (Abstract).

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29. It would have been obvious to one of ordinary skill in the art to incorporate a MEMS into the structure of Tabrizi in order to provide a passive component as required by Tabrizi (Col. 5, Lines 1-4).

30. Claims 252-256 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tabrizi (U.S. 6,867,499) in combination with Korman (U.S. 5,959,357)

31. Tabrizi discloses the elements stated in paragraph 7 of this office action, but does not appear to explicitly disclose its substrate comprising second layer, said first layer being on said second layer, wherein said first layer is the silicon and said second layer is a metal copper.

32. Korman (Fig. 3) utilizes a substrate comprising a first layer on a copper, second metal layer (22).

33. It would have been obvious to one of ordinary skill in the art to modify the silicon substrate of Tabrizi such that a portion is formed on a second layer that is a metal copper in order to provide a heat spreader as taught by Korman (Col. 4, Lines 55-56).

Response to Arguments

34. Applicant's arguments with respect to claims have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

35. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The prior art disclose in Efland (U.S 6,236,098) the use of a two-layer substrate, wherein its first layer is formed on a metal, second layer to provide heat dissipation.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to James M. Mitchell whose telephone number is (571) 272-1931. The examiner can normally be reached on M-F 8:00-4:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl Whitehead Jr. can be reached on (571) 272-1702.


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The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Jmm, J.D.
August 6, 2006




CARL WHITEHEAD, JR.
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2800